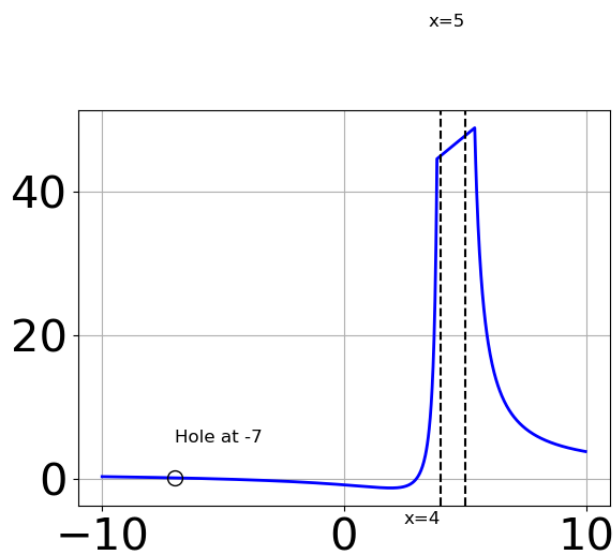


1. Determine the horizontal and/or oblique asymptotes in the rational function below.

$$f(x) = \frac{6x^3 - 1x^2 - 75x + 100}{3x^2 - 14x + 15}$$

- A. Horizontal Asymptote of  $y = 2.0$
- B. Horizontal Asymptote at  $y = 3.0$
- C. Oblique Asymptote of  $y = 2x + 9$ .
- D. Horizontal Asymptote of  $y = 2.0$  and Oblique Asymptote of  $y = 2x + 9$
- E. Horizontal Asymptote of  $y = 3.0$  and Oblique Asymptote of  $y = 2x + 9$

2. Which of the following functions *could* be the graph below?

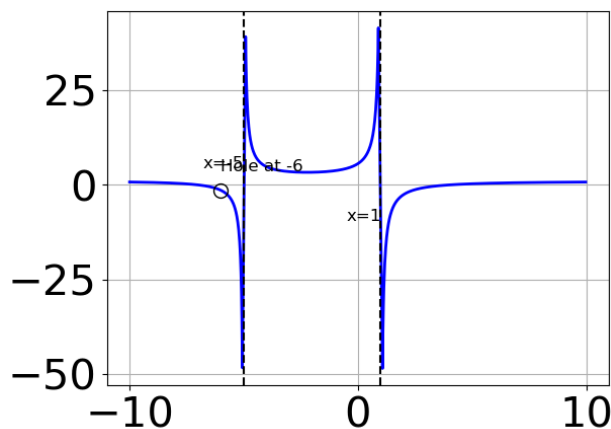


- A.  $f(x) = \frac{x^3 + 5.0x^2 - 12.0x - 36.0}{x^3 - 2.0x^2 - 43.0x + 140.0}$
- B.  $f(x) = \frac{x^3 - 10.0x^2 + 3.0x + 126.0}{x^3 + 2.0x^2 - 43.0x - 140.0}$
- C.  $f(x) = \frac{x^3 - 6.0x^2 - 9.0x + 54.0}{x^3 + 2.0x^2 - 43.0x - 140.0}$

D.  $f(x) = \frac{x^3 + 10.0x^2 + 3.0x - 126.0}{x^3 - 2.0x^2 - 43.0x + 140.0}$

E. None of the above are possible equations for the graph.

3. Which of the following functions *could* be the graph below?



A.  $f(x) = \frac{x^3 - 2.0x^2 - 43.0x + 140.0}{x^3 + 10.0x^2 + 19.0x - 30.0}$

B.  $f(x) = \frac{x^3 + x^2 - 40.0x - 112.0}{x^3 - 10.0x^2 + 19.0x + 30.0}$

C.  $f(x) = \frac{x^3 + 9.0x^2 - 10.0x - 168.0}{x^3 + 10.0x^2 + 19.0x - 30.0}$

D.  $f(x) = \frac{x^3 - 9.0x^2 - 10.0x + 168.0}{x^3 - 10.0x^2 + 19.0x + 30.0}$

E. None of the above are possible equations for the graph.

4. Determine the vertical asymptotes and holes in the rational function below.

$$f(x) = \frac{8x^3 - 18x^2 - 15x + 25}{6x^2 - 19x + 10}$$

A. Vertical Asymptotes of  $x = 0.667$  and  $x = -1.25$  with a hole at  $x = 2.5$

B. Vertical Asymptotes of  $x = 0.667$  and  $x = 2.5$  with no holes.

- C. Holes at  $x = 0.667$  and  $x = 2.5$  with no vertical asymptotes.
  - D. Vertical Asymptote of  $x = 0.667$  and hole at  $x = 2.5$
  - E. Vertical Asymptote of  $x = 1.333$  and hole at  $x = 2.5$
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5. Determine the horizontal and/or oblique asymptotes in the rational function below.

$$f(x) = \frac{20x^3 - 73x^2 - 34x + 24}{16x^3 + 44x^2 - 113x - 60}$$

- A. Vertical Asymptote of  $y = 4$
  - B. Horizontal Asymptote of  $y = 0$
  - C. Vertical Asymptote of  $y = -1.250$
  - D. Horizontal Asymptote of  $y = 1.250$
  - E. None of the above
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6. Determine the vertical asymptotes and holes in the rational function below.

$$f(x) = \frac{9x^3 - 33x^2 + 10x + 24}{12x^2 - x - 20}$$

- A. Holes at  $x = -1.25$  and  $x = 1.333$  with no vertical asymptotes.
  - B. Vertical Asymptotes of  $x = -1.25$  and  $x = 1.333$  with no holes.
  - C. Vertical Asymptote of  $x = 0.75$  and hole at  $x = 1.333$
  - D. Vertical Asymptote of  $x = -1.25$  and hole at  $x = 1.333$
  - E. Vertical Asymptotes of  $x = -1.25$  and  $x = -0.667$  with a hole at  $x = 1.333$
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7. Determine the horizontal and/or oblique asymptotes in the rational function below.

$$f(x) = \frac{6x^3 + x^2 - 11x - 6}{3x^2 - 7x - 6}$$

- A. Horizontal Asymptote of  $y = 3.0$  and Oblique Asymptote of  $y = 2x + 5$
  - B. Horizontal Asymptote at  $y = 3.0$
  - C. Oblique Asymptote of  $y = 2x + 5$ .
  - D. Horizontal Asymptote of  $y = 2.0$  and Oblique Asymptote of  $y = 2x + 5$
  - E. Horizontal Asymptote of  $y = 2.0$
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8. Determine the horizontal and/or oblique asymptotes in the rational function below.

$$f(x) = \frac{15x^3 + 17x^2 - 46x - 40}{-25x^3 - 20x^2 + 16x + 32}$$

- A. Vertical Asymptote of  $y = 0.800$
  - B. Horizontal Asymptote of  $y = 0$
  - C. Horizontal Asymptote of  $y = -0.600$
  - D. Vertical Asymptote of  $y = -2$
  - E. None of the above
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9. Determine the vertical asymptotes and holes in the rational function below.

$$f(x) = \frac{12x^3 + 19x^2 - 101x + 60}{6x^2 - x - 15}$$

- A. Vertical Asymptotes of  $x = -1.5$  and  $x = 1.667$  with no holes.
- B. Holes at  $x = -1.5$  and  $x = 1.667$  with no vertical asymptotes.
- C. Vertical Asymptotes of  $x = -1.5$  and  $x = 0.75$  with a hole at  $x = 1.667$
- D. Vertical Asymptote of  $x = -1.5$  and hole at  $x = 1.667$
- E. Vertical Asymptote of  $x = 2.0$  and hole at  $x = 1.667$

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10. Determine the vertical asymptotes and holes in the rational function below.

$$f(x) = \frac{8x^3 - 34x^2 + 45x - 18}{8x^2 - 2x - 15}$$

- A. Vertical Asymptote of  $x = -1.25$  and hole at  $x = 1.5$
  - B. Vertical Asymptote of  $x = 1.0$  and hole at  $x = 1.5$
  - C. Vertical Asymptotes of  $x = -1.25$  and  $x = 0.75$  with a hole at  $x = 1.5$
  - D. Vertical Asymptotes of  $x = -1.25$  and  $x = 1.5$  with no holes.
  - E. Holes at  $x = -1.25$  and  $x = 1.5$  with no vertical asymptotes.
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